

CITY OF FRESNO

Traffic Impact Study

Report Guidelines



E x c e l l e n c e M a t t e r s

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Prepared by City of Fresno
Department of Public Works

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TRAFFIC IMPACT STUDY GUIDELINES

1.0 PURPOSE

The purpose of the City of Fresno Traffic Impact Study Guidelines is to establish general procedures and requirements for the preparation of traffic impact studies associated with development within the City of Fresno. The term “**guidelines**” is important in that we recognize that every project and study context is unique. These guidelines are intended as a check-list for study preparers to be sure they have not missed any regular study items. They are not intended to be prescriptive to the point of eliminating professional judgment or creativity. A traffic impact study should be a stand alone document that could be reproducible by a peer consultant or City staff based on the information provided in the document.

2.0 WHEN TRAFFIC IMPACT STUDIES ARE REQUIRED

Unless waived by the Traffic Engineering Manager, a Traffic Impact Study (TIS) will be required by the City to adequately assess the impacts of development projects on the existing and/or planned street system under the following conditions:

1. When project-generated traffic is expected to be greater than one hundred (100) vehicle trips during any peak hour.
2. When a project includes a General Plan Amendment (GPA) which changes the land use.
3. When the project traffic will substantially affect an intersection or roadway segment already identified as operating at an unacceptable level of service.
4. When the project will substantially change the off-site transportation system or connection to it as determined by the Traffic Engineering Manager.

A traffic impact study requires updating when it has been two or more years with no activity, since the existing traffic impact study was completed. After two years the existing TIS is considered antiquated and irrelevant. In cases where a master traffic impact study is prepared for a large development, the specific phases will generally not require supplemental traffic impact studies, as long as, the master traffic impact study analyzed the large development in phases and the specific phases are consistent with the master traffic study.

3.0 TRAFFIC IMPACT STUDY AREA

The intersections and roadway segments to be covered by traffic impact studies will be determined on a case-by-case basis and shall be sufficient in size to include existing and planned streets and intersections that may be impacted by the proposed development. The scope of the TIS, including the study area, proposed trip distribution, and trip generation

shall be reviewed and approved by the Traffic Engineering Manager or designee prior to preparation of the study.

The applicant shall also consult with the State of California Department of Transportation (CALTRANS) to determine the California Environmental Quality Act (CEQA) levels of significance with regard to traffic impacts on CALTRANS' freeway facilities. This consultation shall also include a determination of CALTRANS requirements for the study of traffic impacts to its facilities and the mitigation of any such impacts shall be considered when scoping and determining impacts on CALTRANS' controlled facilities. This analysis must follow the most current CALTRANS Guide for the Preparation of Traffic Impact Studies (December 2002) and can be obtained from <http://www.dot.ca.gov>. Correspondence with CALTRANS shall be provided to the City Traffic Engineering Department.

The applicant shall also consult with the County of Fresno to determine the CEQA levels of significance with regards to traffic impacts on County roadway facilities. Correspondence with the County shall be provided to the City Traffic Engineering Department.

4.0 LEVELS OF SERVICE

All City intersections and roadway segments shall operate at a LOS D or better under the near-term conditions, unless a finding of overriding consideration was adopted in the Master General Plan EIR. Under long-term conditions (Year 2025 Conditions) all City intersections and roadway segments shall operate at a LOS D or better, except for the roadway segments adopted in the Master General Plan EIR to operate at LOS E or F. The LOS shall be based on average delay for signalized and unsignalized intersections and Florida Tables for roadway segments. Average delay for study intersections shall be summarized in a table. The traffic analysis methodologies for the facility types indicated below will be accepted without prior consultation.

- Signalized Intersections¹ – Highway Capacity Manual* using Highway Capacity Software (HCS), TRAFFIX, Synchro, or other software approved by the City Traffic Engineer
- Unsignalized Intersections – Highway Capacity Manual* using HCS, TRAFFIX, SimTraffic, or other software approved by the City Traffic Engineer
- Signal Warrants – MUTCD Signal Warrants*
- Roadway Segments – HCM*, Florida Tables

* Most current edition of the Highway Capacity Manual by Transportation Research Board, and MUTCD shall be used.

¹ The procedures in the Highway Capacity Manual do not explicitly address operations of closely spaced signalized intersections. Under such conditions, several unique characteristics must be considered, including spill-back potential from the downstream intersection to the upstream intersection, effects of downstream queues on upstream saturation flow rate, and unusual platoon dispersion or compression between intersections. An example of such closely spaced operations is signalized ramp terminals at urban interchanges. Queue intersections between closely spaced intersections may seriously distort the procedures in the HCM. In this case simulation of the study area maybe necessary as determined by the City Traffic Engineering Manager.

While the City of Fresno does not officially advocate the use of any software, Synchro is the software used by City staff. The LOS analysis at study intersections shall be conducted using the following default values as applicable:

- Use of signal timing plans, if available. If not available, then:
 - Minimum split time for protected left-turn phase shall not be less than 12 seconds if volumes warrant the need.
 - Minimum pedestrian times should be satisfied on all phases with pedestrian phase for signals modeled as coordinated signals.
 - For study intersections modeled as actuated uncoordinated signals, the intersections shall be evaluated with at-least 10 pedestrian calls per hour in the Existing + Project and 2025 Conditions, if pedestrian projections are not available.
 - If existing cycle lengths are available they should be utilized. In instances where existing cycle lengths are not available, LOS calculations should be conducted using the natural cycle lengths. The cycle lengths should remain constant for comparison purposes unless the project is changing the character of the intersection and it is noted in the report.
 - In instances where signalized intersections are coordinated, coordinated cycle lengths should be determined based on the natural cycle lengths of the coordinated signals and shall be used for evaluation purposes.
 - Minimum All-Red time(s) shall equal 1.0 seconds.
 - Minimum Yellow time shall equal 3.5 seconds, or greater based upon the approach speeds.
- Where existing traffic volumes are collected and peak hour factors are available, then LOS calculations for Existing Condition scenarios and the near-term scenario should use available peak hour factors provided the traffic counts are included in the Appendix. For all cumulative scenarios and existing conditions where peak hour factors are not available, factors as per the HCM shall be used and shall be consistent throughout the cumulative scenarios and peak hours.
- Existing storage lengths shall be entered as input data if LOS calculations are conducted using Synchro.

5.0 TRAFFIC ANALYSIS SCENARIOS

The following scenarios shall be included in the traffic impact study:

- A. For projects requiring a General Plan Amendment, intersection LOS analysis and calculation work sheets, as well as figures showing turning volumes and lane configurations shall be included in the report for the following traffic scenarios.
 - a. Existing Conditions – Current year traffic volumes and peak hour LOS analysis
 - b. Existing plus Project Conditions – Trip generation and trip distribution added to the previous scenario and LOS analysis

- c. Near Term Analysis (Existing plus Approved and Pending Projects plus Proposed Project Conditions) – Trip generation and trip distribution added to the previous scenario and LOS analysis
 - d. Cumulative Year 2025 Conditions – Year 2025 build-out conditions (LOS analysis) as per the General Plan (20 years from existing conditions and consistent with the latest Fresno COG model)
 - e. Cumulative Year 2025 plus Proposed Project Conditions – Project traffic added to the previous scenario and LOS analysis
 - f. If any phasing is to take place then such phasing should be studied at its appropriate build out year in addition to the above scenarios.
 - g. Trip traces to affected Caltrans freeway interchanges shall be performed for the current General Plan land use and the land use proposed per the GPA.
- B. For projects with the planned land uses as called for in the 2025 General Plan, intersection LOS analysis and calculation work sheets, as well as figure showing turning volumes shall be included in the report for the following traffic scenarios.
- a. Existing Conditions – Current year traffic volumes and peak hour LOS analysis
 - b. Existing plus Project Conditions – Trip generation and trip distribution added to the previous scenario and LOS analysis
 - c. Near Term Analysis (Existing plus Approved and Pending Projects plus Proposed Project Conditions) – Trip generation and trip distribution added to the previous scenario and LOS analysis
 - d. Cumulative Year 2025 Conditions – Year 2025 build-out conditions (LOS analysis) as per the General Plan (20 years from existing conditions and consistent with the latest Fresno COG model)
 - e. If any phasing is to take place then such phasing should be studied at its appropriate build out year in addition to the above scenarios.
 - f. Trip distribution to affected Caltrans freeway interchanges shall be performed for the proposed project.

Year 2025 Conditions traffic volumes shall be projected based on the method documented by Fresno County Council of Governments (COG) model steering committee using procedures such as the increment method and TurnsW32. The City of Fresno is requesting a consistent approach to the development of Cumulative 2025 traffic volumes. The methodology for developing the forecasts shall be clearly documented in the report and model runs provided by Fresno COG included in the appendix. The following scenarios shall be requested from Fresno COG staff to perform this forecasting correctly:

Current Year Model Run (Existing Conditions Model),
2025 No Project Model Run (Cumulative Conditions Model),
2025 Project SelectZone FRATAR Model Run, and
Near-term opening year model run if necessary.

Please contact Fresno COG staff and/or review the Fresno COG webpage for the correct use of the model to forecast Cumulative volumes.

6.0 TRAFFIC COUNTS

Traffic counts should be collected and included in the Appendix. Available existing counts can be used if they are less than twelve (12) months old and the counts have not be significantly changed due to more recent development in the vicinity. The traffic engineering manager or the designee shall approve all requests to use existing available counts.

Common rules for conducting traffic counts include but are not limited to:

- Peak hour turning movement volumes shall be conducted on Tuesdays, Wednesdays, or Thursdays during weeks not containing a holiday. Counts shall be conducted in favorable weather conditions.
- Counts shall be collected when schools and colleges are in session, but not during the first two weeks that the schools and colleges are in session. Counts collected when schools and colleges are not in session shall be approved by the Traffic Engineering Manager, including a methodology for adding historical school traffic volumes in to the analysis.
- Counts shall be collected during AM (7:00 a.m. to 9:00 a.m.) and PM (4:00 p.m. to 6:00 p.m.) peak hours, unless otherwise specified (such as midday or weekend peak periods).
- Counts should include the peak hour factor calculation.

7.0 TRIP GENERATION

Trip generation should be based on one or more of the following:

- Institute of Transportation Engineers (ITE) Trip Generation Manual (most current edition).
 - Rates should be calculated using the average weight or weighted average formula when applicable
 - Special consideration should be given for ITE rates based on antiquated data or a small sample may require additional data collection to determine the appropriate trip generation
- New rates should be generated using community examples for uses not updated or included in the ITE Trip Generation Manual.
- No pass-by trip reductions are allowed unless justified to and approved by the City Traffic Engineer.

Projected daily trips, AM and PM peak hour trips for the approved, pending and proposed project shall be summarized in the table. Trip generation rates, factors and source should be provided. Trip generation should be summarized in a table form as follows:

Proposed Trip Generation for Weekday

	Size		Daily		A.M. Peak Hour					P.M. Peak Hour				
			*	Trips	*	In:Out	In	Out	Total	*	In:Out	In	Out	Total
Retail	4	ksf	120	480	4	60:40	12	8	19	11	50:50	26	26	53
Townhomes	32	Apts	7.5	240	10	35:65	8	16	24	10	65:35	16	8	24
Senior Housing	100	Units	3.6	360	12	40:60	17	26	43	12	60:40	26	17	43
Total Trips			1,080				37	49	86			68	52	120

* = Rate

8.0 TRIP DISTRIBUTION

A figure illustrating the percentage of peak hour traffic going to and from various destinations along the transportation network shall be provided. Trip distribution shall be based on existing travel patterns, locations of complimentary land uses, and model runs of the Fresno Council of Governments Travel Model. A figure illustrating peak hour project only trips at the driveways, study intersections and roadway segments shall be provided based on the trip distribution. If the trip distribution is different between existing, near-term, and cumulative conditions then a figure needs to be provided for each different trip distribution with supporting discussion and justification. The model should be used for a general trip distribution to and from the North, South, East, and West, however the project trips should be manually distributed to the driveways, intersections, and roadway segments. Please do not rely on the model to distribute project trips. For General Plan Amendments, the TIS shall include a trip distribution to affected Caltrans freeway interchanges for both the current General Plan land use and the proposed land use per the GPA.

9.0 APPROVED AND PENDING PROJECTS

Approved and pending projects located within the vicinity of the project (i.e. developments generating vehicle trips that would impact study intersections and/or roadway segments) or as determined by Traffic Engineering Manager, that can reasonably be expected to be in place by the project's build out year must be included in the analysis. Related projects shall include all approved, pending, or constructed projects that are not occupied at the time of the existing traffic counts. A list of approved and pending projects shall be submitted to Traffic Engineering Section for review and approval along with the scope of work. Traffic Engineering staff will work with consultants to develop the list if necessary. A table summarizing the approved and pending projects with their locations, and trip generation shall be provided. If conditional use permit/parcel map/tract numbers are available then they should be provided in the table. Pending projects are defined as those projects that have been accepted for processing by the City of Fresno Planning and Development Department.

10.0 SITE ACCESS AND CIRCULATION

Site access and circulation analysis shall be conducted and recommendations shall be included in the TIS to address safe and acceptable traffic operations. A figure illustrating the proposed site plan with proposed primary access points should be provided. Discussion on the location and distance of the access points from nearby intersections should also be provided. The proposed site plan should illustrate access points and peak hour project only trips at the access points. The TIS should calculate anticipated queues and minimum required throat depth (MRTD) at the project access points and summarize in a table. The analysis should also evaluate the proposed site plan for sight distance and other unsafe traffic conditions and provide recommendations to mitigate them. The TIS shall also conceptually address safe pedestrian paths of travel from

- residential developments to school sites,
- public streets to commercial and residential areas, and
- nearby bus stops to project sites.

11.0 QUEUING AT STUDY INTERSECTIONS

Queuing analysis for study intersections shall be conducted and documented in the TIS based on the LOS calculations. Recommendations for queues under existing conditions or projected to exceed the available storage shall be provided. Recommendations such as but not limited to extending existing storage, addition of exclusive turn-lanes, innovative techniques shall be considered and recommended.

12.0 SIGNIFICANT IMPACT THRESHOLD

For study intersections, the impact is considered significant if the addition of the traffic generated from the proposed project results in any one of the following:

- Triggers an intersection operating at acceptable LOS to operate at unacceptable levels of service
- Triggers an intersection operating at unacceptable LOS (LOS E) to operate at LOS F.
- Increases the average delay for a study intersection that is already operating at unacceptable LOS.

13.0 ANALYSIS DISCUSSION

The TIS should discuss conclusions regarding the adverse impacts caused by the proposed project on the roadway system. If the cumulative traffic impact of this and other projects require mitigation measures, that are not covered by current Urban Growth Management (UGM) or traffic signal impact fees, then the project's fair share percentage shall be calculated using peak-hour volumes and provided to the Traffic Engineering Manager in the TIS.

For all recommendations to increase the number of travel lanes on a street or at an intersection as a mitigation measure, the report must clearly identify the impacts associated with such a change such as whether or not additional right of way will be required and whether it is feasible to acquire the right of way based on the level of development of the adjacent land and buildings (if any).

The TIS should discuss other possible adverse impacts on traffic. Examples of these are: (1) the limited visibility of access points on curved roadways; (2) the need for pavement widening to provide left-turn and right-turn lanes at access points into the proposed project; (3) the impact of increased traffic volumes on local residential streets; and (4) the need for road realignment to improve sight distance.

Projects which propose to amend the City's General Plan Land Use and substantially increase potential traffic generation must provide an analysis of the project at current planned land use versus proposed land use in the build out condition for the project area, including future 2025 conditions. The purpose of such analysis is to provide decision makers with the understanding of the planned circulation networks ability to accommodate additional traffic generation caused by the proposed General Plan Land Use amendments.

14.0 TRAFFIC IMPACT STUDY - REPORT FORMAT

COVER PAGE

1. Project address
2. Project name (if applicable)
3. Prepared for
4. Date (month/day/year)
5. Consultant contact information including a contact name
6. Consultant job number (if applicable)
7. City Reference Number (i.e. TIS XX-XXX)
8. Entitlement Number (i.e. Tract or CUP Number)
9. City Planner Name (if known)
10. Stamp and/or signature of qualified engineer or authorized owner/principal of firm stating the study was prepared and reviewed under their supervision and direction.

This Traffic Impact Study has been prepared under the direction of _____. _____ attests to the technical information contained therein and has judged the qualifications of recommendations, conclusions, and decisions are based on City of Fresno guidelines, general engineering standards, and California/Federal laws.

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LIST OF FIGURES

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EXECUTIVE SUMMARY

Provide summary of the TIS, project location and size, intersections analyzed, study scenarios, impacts, mitigation and recommendations in a figure and table. Methodology used to analyze the impacts does not need to be included in the executive summary. Document results of LOS analysis, intersections and roadway segments Provide summary of site access and circulation. Results of LOS analysis should be summarized in a table form as follows for both existing and cumulative scenarios:

Summary of Intersection Level of Service

<i>Intersection</i>	<i>Existing</i>		<i>Existing plus Proposed Project</i>		<i>Existing plus Approved and Pending plus Proposed Project</i>	
	<i>Delay</i>	<i>LOS</i>	<i>Delay</i>	<i>LOS</i>	<i>Delay</i>	<i>LOS</i>

INTRODUCTION

Provide description of the project, location, size and proposed primary access. A vicinity map showing the site location and the study area relative to other transportation systems along with study intersections and roadway segments should be provided. Document study intersections, roadway segments and study scenarios providing brief explanation on each study scenarios. Describe the methodology used to analyze the impacts of the study and the thresholds for determining an impact.

EXISTING CONDITIONS

Provide a description of existing streets and roadways within the project site (if any) and in the surrounding area. Include information on the roadway classifications (per the City of Fresno Circulation Element), the number of lanes, posted speed limits, divided/undivided and bike lanes.

Existing daily directional and peak-hour through and turning traffic volumes on the roadways surrounding and/or logically associated with the project site, including major highways and freeways. Local streets affected by the project should also be shown. Each report shall include appendices providing count data used in the preparation of the report. The source and date of the traffic volume information shall be indicated. A figure illustrating the peak hour traffic volumes, lane configurations, and traffic control at the study intersections and roadway segments should be provided.

All assumed roadways and intersections or any other transportation circulation improvements must be identified and discussed. The discussion should include the scope and the status of the assumed improvements including the construction schedule and financing plan.

In addition any transit facilities within 1,300 feet of the project or study intersections/roadways segments, including the service provider(s), routes, frequency and location/amenities of existing bus stops should be provided.

Existing and planned bicycle and pedestrian facilities adjacent to the project site, utilized by the project, connected to by the project, or impacted by the project should be identified and described in detail.

Results of LOS analysis should be summarized in table (in a format illustrated above) and discussed. If any of the study intersections or roadway segments are operating at unacceptable levels, mitigation measures should be identified.

EXISTING PLUS PROPOSED PROJECT CONDITIONS

This scenario is required by CEQA to show the impacts of the proposed project on the existing conditions. It should include a project description, trip generation and distribution, level of service analysis, and appropriate tables, figures, and recommendations/mitigation as described below.

Project Description

A description of the project, including factors which quantify traffic generators, e.g., dwelling units, square feet of office space, persons to be employed, restaurant seats, acres of raw land, etc. Provide site plan including access, project only trips at the access points, circulation, parking, and loading as applicable.

Trip Generation and Trip Distribution

Provide trip generation and trip distribution as per Section 7.0 and 8.0 of this document. Provide any relevant information, discussion if applicable.

Level of Service Analysis

Provide a figure illustrating peak hour traffic volumes at the study intersections and roadway segments for Existing plus Proposed Project Conditions. Results of LOS analysis should be summarized in table and discussed. If any of the study intersections or roadway segments are projected to operate at unacceptable levels, mitigation measures should be identified.

Site Access and Circulation

Provide site access and circulation analysis and discussion as per Section 10.0 of this document. Provide a figure showing on site and circulation recommendations.

NEAR-TERM ANALYSIS (EXISTING PLUS APPROVED AND PENDING PROJECT PLUS PROPOSED PROJECT CONDITIONS)

Approved and pending projects located within the vicinity of project, (projects that would impact study intersections and/or roadway segments or as determined by Traffic Engineering Manager), that can reasonably be expected to be in place by the

project's construction year along with the trip generation should be summarized in a table. A figure illustrating the Existing plus Approved and Pending Projects Plus Proposed Project peak hour traffic volumes should be provided.

Results of LOS analysis should be summarized in table and discussed. If any of the study intersections or roadway segments are projected to operate at unacceptable levels, mitigation measures should be identified.

CUMULATIVE YEAR 2025 AND CUMULATIVE YEAR 2025 PLUS PROJECT CONDITIONS

Provide similar information for both scenarios as above referenced scenarios. Please discuss in detail how the traffic volume forecasts were developed using the Fresno COG model. This information should be easy to follow and reproducible by a peer consultant and/or City of Fresno staff.

QUEUING

Discuss and provide recommendations to mitigate unacceptable queues at study intersections under appropriate scenarios as applicable.

SIGNAL WARRANTS

Provide signal warrants analysis and discuss results of the analysis under appropriate scenarios as applicable.

CONCLUSION

MITIGATIONS & RECOMMENDATIONS

Provide objective recommendations in a table or figure and discuss the timing and funding of recommendations.

APPENDIX

Traffic Counts

Fresno COG Model Runs and Turning Movement Forecast outputs

Signal Warrants

References and Bibliography

Level of Service Calculation sheets

15.0 TRAFFIC IMPACT STUDY – SCOPE OF WORK REQUESTS

The applicant or consultant shall provide to the Traffic Engineering Manager or the appointed designee the project location, size, land use and proposed primary access. The list of proposed study intersections, roadway segments and scenarios shall be included in the scoping request. Typically the roadway segments between study intersections should be studied. Please also contact other potentially affected agencies such as Caltrans District 6, County of Fresno, County of Madera, and City of Clovis.